

CLAIMS

1. A bearing comprising a first bearing surface separated by a gap having a convergent region and containing fluid from a second bearing surface, wherein, in use, said first bearing surface moves relative to said convergent region so as to entrain said fluid into said convergent region whereby said second bearing surface slips relative to said fluid and pressure within said fluid between said first bearing surface and said second bearing surface supports a load applied between said first bearing surface and said second bearing surface.
10
2. A bearing as claimed in claim 1, wherein said second bearing surface is substantially non-wetted by said fluid.
3. A bearing as claimed in any one of claims 1 and 2, wherein said first bearing surface is wetted by said fluid.
15
4. A bearing as claimed in any preceding claim, wherein said fluid is an oil and said first bearing surface is oleophilic.
- 20 5. A bearing as claimed in any preceding claim, wherein said fluid is an oil and said second bearing surface is oleophobic.
6. A bearing as claimed in any one of the preceding claims, wherein said fluid is a film of fluid disposed upon said first bearing surface.
25
7. A bearing as claimed in any one of claims 1 to 5, wherein said bearing is immersed in said fluid.
8. A bearing as claimed in claim 6, wherein said second bearing surface is part of a data access head operable to access data stored on a movable data storage media, said first bearing surface being a surface of said data storage media.
30
9. A bearing as claimed in claim 8, wherein said movable data storage media is a magnetic disc and said data access head is a magnetic disc data access head.

10. A bearing as claimed in any one of the preceding claims, wherein said bearing is part of an electromechanical system, said first surface being part of a moving first component and said second surface being part of a stationary second component.

5

11. A bearing as claimed in claim 10, wherein the electromechanical system is a microelectromechanical system.

10 12. A bearing as claimed in any one of the preceding claims, wherein said first surface has a surface energy of greater than 0.05 J/m^2 .

13. A bearing as claimed in any one of the preceding claims, wherein said second surface has a surface energy of less than 0.05 J/m^2 .

15 14. A bearing as claimed in any one of the preceding claims, wherein said first surface is one of;

a metal; and
a ceramic.

20 15. A bearing as claimed in any one of the preceding claims, wherein said second surface is one of;

a polymer;
a fluorinated surfactant coating; and
a hydrocarbon surfactant coating.

25

16. A bearing as claimed in any one of the preceding claims, wherein said second bearing surface has a surface roughness less than 0.01 micron root mean square when measured with an upper cut-off length of 1 micron.

30 17. A bearing as claimed in any one of the preceding claims, wherein said fluid has a surface tension higher than a critical surface tension of said second bearing surface.

18. A bearing as claimed in any one of the preceding claims, wherein said fluid is one of;

- water;
- glycerol;
- an ionic liquid; and
- a synthetic lubricant.

5

19. A bearing as claimed in claim 18, wherein said synthetic lubricant is an ester.

10

20. A bearing as claimed in claim 18, wherein said synthetic lubricant is an ether.

21. A bearing as claimed in any one of the preceding claims, wherein said first bearing surface and said second bearing surface is one of;

15

- a bulk material;
- a surface treatment; and
- a coating.

20

22. A bearing as claimed in any one of the preceding claims, wherein said fluid contains an additive to form a non-wetting film at the second bearing surface.

25

23. A bearing comprising a wettable surface moveable in relation to and separated by a gap from a substantially non-wettable surface, said gap having a convergent region and an intermediate lubricant layer therein, said intermediate lubricant layer adhering at a first interface to said wettable surface and non-adhering at a second interface to said substantially non-wettable surface.

30

24. A bearing as claimed in claim 23, wherein movement of said wettable surface entrains said lubricant layer into said convergent region so as to generate a pressure within said intermediate lubricant layer for supporting a load.

25. A bearing as claimed in claim 24, wherein movement of said wettable surface results in slipping between said second interface of said intermediate lubricant layer and said substantially non-wettable surface.

26. A half wetted bearing.